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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,281	04/22/2004	Brian Peter Arnese	839-1549	7255
30024 7590 10/05/2007 NIXON & VANDERHYE P.C. 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER ZIMMERMAN, JOHN J	
			ART UNIT 1794	PAPER NUMBER
			MAIL DATE 10/05/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/829,281	<b>Applicant(s)</b> ARNESS ET AL.	
	<b>Examiner</b> John J. Zimmerman	<b>Art Unit</b> 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/22/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## SECOND OFFICE ACTION

### *Amendments*

1. This Second Office Action is in response to the correspondence titled "AMENDMENT" received July 10, 2007. Claims 1-3 are pending in this application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's disclosure of the prior art in view of Williams (U.S. Patent 2,657,902), Beeck (U.S. 2001/0012484) and Field (U.S. Patent 4,672,727).

4. Applicant discloses that nozzle airfoils having been constructed with a plurality of radially spaced apertures opening through the trailing edge in combination with radially spaced film cooling holes axially spaced from and adjacent the trailing edge to extend the operating life

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of the turbine nozzles to nearly twice the previous life (e.g. see "BACKGROUND OF THE INVENTION", paragraph [0002] of the specification). Applicant also discloses that turbine airfoils have been previously repaired by replacing damaged trailing edge portions with a new replacement trailing edge portion wherein coupons which constitute a replacement trailing edge portion for a nozzle airfoil have been welded to the remaining leading and intermediate sections of an airfoil after the damaged trailing edge portions have been removed. Applicant indicates that this description of the prior art differs from the claimed subject matter in that trailing edge coupons have not been utilized to significantly extend the operation life of turbine airfoils since they have lacked the required cooling configurations (e.g. see "BACKGROUND OF THE INVENTION", paragraphs [0003]-[0004] of the specification). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the cooling hole improvements made current extended life nozzle airfoils when repairing damaged nozzle airfoils in order to take advantage of the potential increase in operation life afforded by the inclusion of cooling holes. It must be assumed that one of ordinary skill in the art understands that incorporation of current airfoil improvements in prior airfoils which did not originally contain these improvements would have a motivational economic benefit in increasing operation life.

Applicant's description of the prior art may differ from the pending claims in that applicant may not describe the use of chamfered walls for welding as prior art. Williams has been cited, however, to show that it is conventional in the welding art to chamfer (bevel) the edges of airfoil components to accommodate welding (e.g. see Figures 2-3; column 3, lines 38-40, 49-60). In view of Williams, it would have been obvious to one of ordinary skill in the art at the time the invention was made chamfer the edges of an airfoil repair coupon to accommodate welding

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operations to the main airfoil section. Applicant's description of the prior art may also differ from the pending claims in that applicant may not disclose that the use of a plurality of ribs extending between the pressure and suction sides of the coupon and direction of airflow to a plenum. Beeck, however, clearly shows that ribs are conventionally used between the pressure and suction sides of airfoils and are configured so that cooling air flows between the ribs to a radial plenum (e.g. see paragraph [0025]). In view of Beeck, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rib and radial plenum configurations in an airfoil since such configurations are disclosed to improve cooling.

Regarding claim 2, applicant may not disclose that the use of flared holes to facilitate cooling is prior art, but in any event, Field is applied to clearly show that flared cooling holes are conventional configurations in airfoils to maximize cooling (e.g. see Figures 1-16). Regarding claim 3, applicant may not disclose that these limitations are prior art, but in any event, it would have been obvious to one of ordinary skill in the art to optimize the number of openings and film cooling holes for optimum cooling effectiveness in order to extend the life of the airfoil.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's disclosure of the prior art in view of Jackson (U.S. 2002/0197152), Jackson (U.S. 2003,0082048) or Mendham (U.S. Patent 5,269,057) and further in view of Williams (U.S. Patent 2,657,902), Beeck (U.S. 2001/0012484) and Field (U.S. Patent 4,672,727).

6. Applicant discloses that nozzle airfoils having been constructed with a plurality of radially spaced apertures opening through the trailing edge in combination with radially spaced

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film cooling holes axially spaced from and adjacent the trailing edge to extend the operating life of the turbine nozzles to nearly twice the previous life (e.g. see "BACKGROUND OF THE INVENTION", paragraph [0002] of the specification). Applicant also discloses that turbine airfoils have been previously repaired by replacing damaged trailing edge portions with a new replacement trailing edge portion wherein coupons which constitute a replacement trailing edge portion for a nozzle airfoil have been welded to the remaining leading and intermediate sections of an airfoil after the damaged trailing edge portions have been removed (e.g. see "BACKGROUND OF THE INVENTION", paragraphs [0003]-[0004] of the specification). It would have been obvious to one of ordinary skill in the art at the time the invention was made that prior art cooled airfoils (which are disclosed by applicant to be constructed with a plurality of radially spaced apertures opening through the trailing edge in combination with radially spaced film cooling holes axially spaced from and adjacent the trailing edge) would benefit from being repaired by replacing their damaged trailing edge portions with coupons having the original configuration of the cooled airfoils in order to maintain the increase in operation life afforded by the cooling holes. Evidence that using repair coupons having cooling holes is conventional in the art is shown by Jackson '048 (e.g. Figure 9), Jackson '152 (Figure 6) and Mendham (Figure 7). Applicant's description of the prior art may differ from the pending claims in that applicant may not describe the use of chamfered walls for welding as prior art. Williams has been cited, however, to show that it is conventional in the welding art to chamfer (bevel) the edges of airfoil components to accommodate welding (e.g. see Figures 2-3; column 3, lines 38-40, 49-60). In view of Williams, it would have been obvious to one of ordinary skill in the art at the time the invention was made chamfer the edges of an airfoil repair coupon to accommodate

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welding operations to the main airfoil section. Applicant's description of the prior art may also differ from the pending claims in that applicant may not disclose that the use of a plurality of ribs extending between the pressure and suction sides of the coupon and direction of airflow to a plenum. Beeck, however, clearly shows that ribs are conventionally used between the pressure and suction sides of airfoils and are configured so that cooling air flows between the ribs to a radial plenum (e.g. see paragraph [0025]). In view of Beeck, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rib and radial plenum configurations in an airfoil since such configurations are disclosed to improve cooling.

Regarding claim 2, applicant may not disclose that the use of flared holes to facilitate cooling is prior art, but in any event, Field is applied to clearly show that flared cooling holes are conventional configurations in airfoils to maximize cooling (e.g. see Figures 1-16). Regarding claim 3, applicant may not disclose that these limitations are prior art, but in any event, it would have been obvious to one of ordinary skill in the art to optimize the number of openings and film cooling holes for optimum cooling effectiveness in order to extend the life of the airfoil.

7. Regarding the use of applicant's description of the prior art in a rejection, it is axiomatic that consideration of the prior art cited by the examiner must, of necessity, include consideration of the admitted state of the art found in applicant's specification, *In re Davis*, 305 F.2d 501, 134 USPQ 256 (CCPA 1962); *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986).

Admitted knowledge in the prior art may be used in determining patentability of the claimed subject matter, *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

*Response to Arguments*

8. Applicant's arguments filed July 10, 2007 have been fully considered but they are not persuasive. Applicant has amended the claims to include the limitations that the coupon includes a trailing edge having a plurality of radially spaced openings "connected to a radially extending plenum" and a plurality of radially spaced ribs extending between opposite pressure and suction sides of the coupon wherein "said ribs shaped to form radially spaced flow channels for directing cooling air to said plenum". Beeck (U.S. 2001/0012484), however, has now been applied in the rejections, above, to clearly show that ribs are conventionally used between the pressure and suction sides of airfoils and are configured so that cooling air flows between the ribs to a radial plenum (e.g. see paragraph [0025]).

*Conclusion*

9. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Beeck (U.S. 2001/0012484) has been applied in the rejections, above, to clearly show that ribs are conventionally used between the pressure and suction sides of airfoils and are configured so that cooling air flows between the ribs to a radial plenum (e.g. see paragraph [0025]). Beeck specifically addresses the amendments presented in the correspondence titled "AMENDMENT" received July 10, 2007. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).



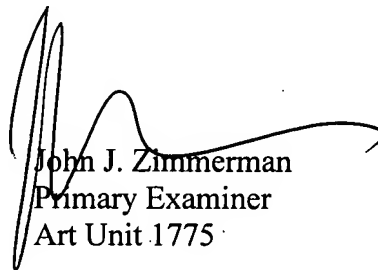
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10. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
September 29, 2007